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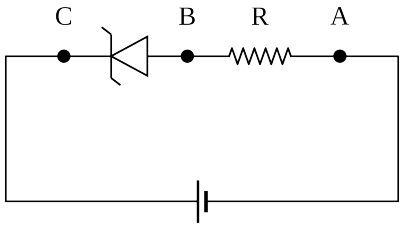
NEET SEMICONDUCTOR ELECTRONICS — SPECIAL PURPOSE DIODES: ZENER DIODE, LED, PHOTODIODE, SOLAR CELL — PYQS

Max. Marks: 48 **Questions:** 12

Section A (MCQ) — 12 questions

Q.1 An ideal Zener diode with breakdown voltage of −3 V is reverse biased with a negative input voltage V_i = −5 V. The magnitude of voltage difference between point B and A is: [RE-NEET (UG) 2026]



(1) 0 V (2) 3 V (3) 2 V (4) 1 V

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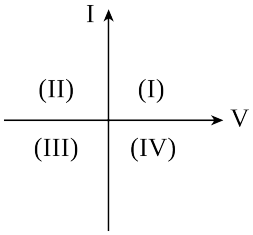
Q.2 Consider the following statements A and B and identify the correct answer :



A. For a solar-cell, the I-V characteristics lies in the IV quadrant of the given graph.

B. In a reverse biased pn junction diode, the current measured in (μA), is due to majority charge carriers. [NEET (UG) 2024]

(1) A is correct but B is incorrect

(2) A is incorrect but B is correct

(3) Both A and B are correct

(4) Both A and B are incorrect

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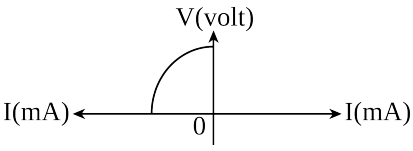
Q.3



The I-V characteristics shown above are exhibited by a [RE-NEET (UG) 2024]

(1) Light emitting diode (2) Zener diode

(3) Photodiode (4) Solar cell

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Q.4 Given below are two statements:

Statement-I: Photovoltaic devices can convert optical radiation into electricity.

Statement-II: Zener diode is designed to operate under reverse bias in breakdown region.

In the light of the above statements, choose the most appropriate answer from the options given below : [NEET (UG) 2023]

(1) Both Statement-I and Statement-II are incorrect.

(2) Statement-I is correct but Statement-II is incorrect.

(3) Statement-I is incorrect but Statement-II is correct.

(4) Both Statement-I and Statement-II are correct.

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Q.5 The incorrect statement about the property of a Zener diode is : [NEET (UG) 2022 (Phase 2)]

(1) p and n regions of Zener diode are heavily doped

(2) Zener voltage remains constant at breakdown

(3) It is designed to operate under reverse bias

(4) Depletion region formed is very wide

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Q.6 Consider the following statements (A) and (B) and identify the correct answer.

(A) A Zener diode is connected in reverse bias, when used as a voltage regulator.

(B) The potential barrier of p-n junction lies between 0.1 V to 0.3 V. [NEET (UG) 2021]

(1) (A) is incorrect but (B) is correct.

(2) (A) and (B) both are correct.

(3) (A) and (B) both are incorrect.

(4) (A) is correct and (B) is incorrect.

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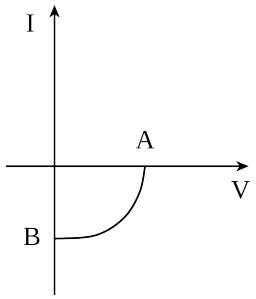
Q.7 The given graph represents V-I characteristic for a semiconductor device.



Which of the following statement is correct ? [AIPMT 2014]

(1) It is V-I characteristic for solar cell where, point A represents open circuit voltage and point B short circuit current.

(2) It is for a solar cell and points A and B represent open circuit voltage and current, respectively.

(3) It is for a photodiode and points A and B represent open circuit voltage and current, respectively.

(4) It is for a LED and points A and B represent open circuit voltage and short circuit current, respectively.

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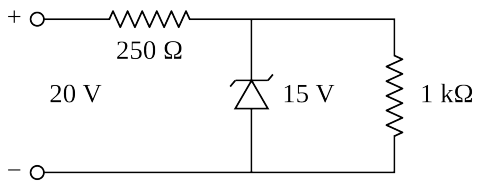
Q.8 A Zener diode, having breakdown voltage equal to 15 V, is used in a voltage regulator circuit shown in figure. The current through the diode is [AIPMT 2011 (Mains)]



(1) 5 mA (2) 10 mA (3) 15 mA (4) 20 mA

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Q.9 A p-n photodiode is fabricated from a semiconductor with a band gap of 2.5 eV. It can detect a signal of wavelength [AIPMT 2009]

(1) 4000 nm (2) 6000 nm

(3) 4000 Å (4) 6000 Å

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Q.10 A p-n photodiode is made of a material with a band gap of 2.0 eV. The minimum frequency of the radiation that can be absorbed by the material is nearly [AIPMT 2008]

(1) 1×10^{14} Hz (2) 20×10^{14} Hz

(3) 10×10^{14} Hz (4) 5×10^{14} Hz

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Q.11 Zener diode is used for [AIPMT 2005]

(1) amplification

(2) rectification

(3) stabilisation

(4) producing oscillations in an oscillator.

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Q.12 In a p-n junction photo cell, the value of the photo-electromotive force produced by monochromatic light is proportional to [AIPMT 2005]

(1) The barrier voltage at the p-n junction.

(2) The intensity of the light falling on the cell.

(3) The frequency of the light falling on the cell.

(4) The voltage applied at the p-n junction.

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	1	4	4	4	4	1	1	3	4	3
Ques.	12										
Ans.	2										